

REMARKS

Claims 5 and 7-24 are pending in the present application. Claims 7-17 and 19-23 are rejected. Claims 7, 8, 17, 19, 20 and 23 are herein amended. No new matter has been added. Applicants thank the Examiner for the courtesies extended in the telephone interview of June 16, 2008. Applicants' Statement of the Substance of the Interview is incorporated herein.

Amendments to the Specification

In Applicants' review of the application, two errors in translation from the original Japanese were noted. Specifically, "(loading amount X rotational speed / time)" at page 12, lines 5-6 is a mistranslation. The correct translation is "(loading amount X number of times / time)." As for the term "number of times", the meaning of the term is as follows. For example, in loading operations using a bucket of a construction machine, the construction machine loads sand into the bucket and dumps the sand from the bucket repeatedly. The "number of times" refers to the repeat count of loading and dumping. As a result of this, for example, work amount of the construction machine is obtained by (loading amount of the bucket · number of times / time). Additionally, "(loading amount X distance)" at page 12, line 7 is a mistranslation. The correct translation is "(loading weight X distance)."

Applicants herein amend the specification to correct these errors. Applicants also amend the specification to replace the capital letter "X" with the multiplication dot "·" to clarify that the recited subject matter is a multiplication operation, and that there is no variable "X". No new matter has been added.

Applicants' Response to Claim Rejections under 35 U.S.C. §103

Claims 7, 9-19 and 21-24 are rejected under 35 U.S.C. §103(a) as being anticipated by Minami (U.S. Patent No. 6,985,804) in view of Ferguson (U.S. Patent Application Publication No. 2003/0114966).

It is the position of the Office Action that Minami discloses the invention as claimed, with the exception of teaching that the fuel consumption ratio is the fuel consumption per work done. The Office Action relies on Ferguson to provide this teaching. Additionally, Applicants note that although the heading of this rejection refers to claims 7, 9-19 and 21-24, this section does not discuss claims 18 and 24, which recite allowable subject matter, and claims 13-16, which are rejected on other grounds, discussed below.

The system of Minami is directed at diesel locomotives, not construction machines. See column 2, lines 28-31. As illustrated in Figure 1, the system includes an engine controller 10, a calculation unit 30 and a display 31. The display 31 is illustrated in Figure 7. The calculation unit 30 computes the fuel consumption amount (Liters) and fuel economy (km/Liter). See column 3, line 64 to column 4, line 24. The calculation unit 30 also computes the excess drive force and the excess drive force ratio. The excess drive force and excess drive force ratio are based on subtracting the running resistance R from the drive force F. See column 4, lines 27-31. Subsequently, an excess fuel consumption amount may be calculated by the calculation unit 30, based on the excess drive force. See column 6, lines 41-53. These data points are displayed on the display 31. See Figure 7.

Also included on the display 31 is a two-dimensional map of 100 squares. On one axis is the amount of accelerator operation and on the other axis is engine rotation speed. At every ten minute interval, the two-dimensional map is updated to show the frequency in which the engine was operated in each of the corresponding squares. See column 9, lines 50-65. Based on this data, the user can visually see his operation habits. Minami also discloses that the two-dimensional map includes a single square X, which represents the most favorable fuel economy. It is unclear how this square X is determined. The two-dimensional map displays color codes corresponding to the amount of operating time in a preceding period spent in each of the 100 squares corresponding to accelerator operation and engine rotation speed settings. Thus, the Office Action broadly interprets Minami to disclose communicating a difference between the measured fuel consumption ratio and a set fuel consumption ratio.

Ferguson is directed at a system and method for remotely monitoring the condition of a machine. Ferguson is primarily related to the monitoring of parameters of a "work machine" by wireless remote means. See abstract and paragraphs [0016] and [0019]. These parameters are referred to by Ferguson as machine data 126. Ferguson states that:

Machine data 126 is preferably information specific to individual machines, such as total hours of operation, fuel consumed, the number of transmission shifts, etc. Preferably, the machine data 126 further includes the specific parameters currently being monitored on the machine and the associated tolerances. Paragraph [0024].

The Office Action appears to recognize that the machine data of Ferguson includes fuel consumed and total hours of operation. The Office Action then alleges that it would have been

obvious to combine the teachings of Ferguson and Minami, “because it would determine the fuel consumption per the total hours of operation during the work done.”

Ferguson does not disclose measuring “fuel consumption per mechanical machine work done” or “corresponding to mechanical machine work done”

First, Applicants respectfully submit that Ferguson does not disclose that the fuel consumption ratio is the “fuel consumption per mechanical machine work done,” as recited by present claim 7. The specification, as herein amended, states that work is determined by work amount detection means 32 according to, for example, “loading amount · number of times / time” or “load weight · distance”. See page 11, line 22 to page 12, line 14. Thus, the word “work” is used to describe mechanical machine work.

Applicants provide the following clarification with respect to the meaning of the word “work.” The term “work” in the specification means operation done by a construction machine, such as excavating earth and sand, transporting or loading sand, or the like. Support for this point is found, for example, in the phrase “various types of work (for example, excavation or the like using the working machine)” at page 6, lines 10-16, in the phrases “the work amount during loading” and “the work amount during transportation” at page 11, line 22 to page 12, line 13, in the phrase “the work of excavating earth and sand” at page 14, lines 20-25, and Fig. 5, etc.

Thus, “work amount” in the specification is, for example, the volume of the loaded sand, which is measured in cubic meters (m³), the weight of the loaded sand which is measured in kilograms (kg), or the weight of the loaded sand multiplied by the distance, which is measured in

kilogram-meters ($\text{kg} \cdot \text{m}$). Accordingly, based upon the suggestion of the Examiner in the telephone interview, Applicants herein amend the claims to recite “mechanical machine work.” It is noted that “mechanical machine work” does not include “work” as used in physics and having units which are Joules (J) or Newton-meters ($\text{N} \cdot \text{m}$).

The Office Action appears to be of the position that fuel consumption per work done can be obtained based on the measured parameters in Ferguson (total hours of operation, fuel consumed, number of transmission shifts, etc.). Applicants respectfully submit that Ferguson does not disclose or suggest sensors or calculating means which determine the amount of mechanical machine work done. As such, no fuel consumption measurement based on mechanical machine work done can be obtained. As is clear from Figures 4 and 5 of the present application, fuel consumption per operating time is a completely different value than fuel consumption per mechanical machine work done. Simply put, fuel consumption per operating time cannot distinguish between fuel consumption when lifting of heavy objects and lifting of light objects. However, fuel consumption per mechanical machine work done can distinguish between these situations. Thus, since Ferguson does not disclose or suggest detecting the “mechanical machine work done” as recited by claim 7, measuring a fuel consumption ratio corresponding to “mechanical machine work done” as recited by claims 17, 19 and 23, the combination of references does not disclose or suggest the embodiment as claimed.

Minami does not disclose communicating a difference between the measured fuel consumption ratio and a set fuel consumption ratio

As a second argument, Applicants respectfully submit that Minami does not disclose communicating a difference between the measured fuel consumption ratio and a set fuel consumption ratio.

In the table portion of the display 31 (right side of Figure 7), Minami discloses display of a fuel economy from a predetermined start-point to present. For example, 6 km/L in Figure 1. In this space, Minami may alternatively display instantaneous fuel economy, best previous fuel economy, or fuel economy in other gear positions. See column 4, lines 17-24. However, these values are never compared with each other.

In the two-dimensional map portion of the display 31, amount of time spent in various operating conditions is compared. Although a single square X representing the optimal fuel economy is presented, the optimal fuel economy is not compared to any other fuel economy. Rather, the two-dimensional map portion of the display 31 only represents a comparison between *time spent* in one optimal fuel economy operating condition versus *time spent* in 99 non-optimal fuel economy operating conditions. In other words, Minami does not disclose comparing raw fuel consumption data, but rather discloses comparing the duration of various fuel economy conditions. On the other hand, as illustrated in Figure 5, the claimed embodiment compares the difference between a measured fuel consumption ratio B and a set fuel consumption ratio S2, measured in liters per cubic meter (l/m^3).

Thus, Applicants respectfully submit that Minami does not disclose or suggest

“communicating a difference between the measured fuel consumption ratio and a set fuel consumption ratio,” as recited by claims 7 and 19. Similarly, Applicants respectfully submit that Minami does not disclose a “comparison means which compares the fuel consumption ratio measured by the measurement means and the reference fuel consumption ratio selected by the selection means,” as required by claim 17. Likewise, Minami does not disclose or suggest the comparing step of claim 23.

Therefore, for at least the above reasons, Applicants respectfully submit that the cited art does not disclose or suggest the embodiments as recited by the independent claims. Applicants respectfully submit that the dependent claims are patentable at least due to their dependency on the independent claims, which Applicants submit are patentable for at least the above reasons. Favorable reconsideration is respectfully requested.

Claims 8, 13-16 and 20 were rejected under 35 U.S.C. §103(a) as being anticipated by Minami in view of Ferguson, and in further view of Yoshimatsu (U.S. Patent No. 6,851,207).

It is the position of the Office Action that the combination of Minami and Ferguson discloses the invention as claimed, with the exception of teaching that the construction machine includes a traveling unit and a working machine mounted on the traveling unit. The Office Action relies on Yoshimatsu to provide this teaching. Yoshimatsu is directed at construction machinery, and includes crawler type lower traveling body 1 and an excavating attachment 9.

In response, Applicants respectfully submit that while Yoshimatsu teaches a traveling unit and working machine unit, the combination of references does not disclose or suggest that the fuel consumption ratio is the fuel consumption per mechanical machine work done by the working machine. As discussed above, Ferguson discloses measuring “total hours of operation, fuel consumed, the number of transmission shifts, etc.” Paragraph [0024]. These parameters appear to have no relation to the work done by the working machine. Rather, these parameters all relate to the travelling machine. Even if these parameters relate to the working machine, these parameters do not measure *mechanical machine work* done. As such, Applicants respectfully submit that the combination of references does not disclose or suggest the invention as claimed.

Allowable Subject Matter

The Office Action indicates that claims 18 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims. Additionally, claim 5 is allowed. However, Applicants respectfully decline to re-write claims 18 and 24 at this time.

For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

Should the Examiner deem that any further action by applicants would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicants' undersigned attorney.

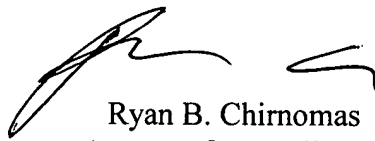
Application No.: 10/570,152
Art Unit: 2857

Amendment under 37 CFR 1.114
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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